former deriving their nourishment entirely from living organic matter, in some cases animal, in others vegetable; the latter from organic matter in a state of decay; but neither having the power of "assimilating," or obtaining their food-materials direct from the atmosphere and the inorganic constituents of the soil. *Saprolegnia* and *Cordiceps* are as fully entitled to the designation of carnivorous or even insectivorous plants as *Dionæa* or *Drosera*. The difference lies chiefly in the localisation of the power of absorption, which we have not generally considered to reside in the foliar organs. By far the most interesting facts brought out in this volume—and we think they are amongst the most important published for many years—are the changes from neutral to acid in the nature of the secretion poured out by the glands of Drosera on their excitement by contact with soluble nitrogenous substances; and the alleged "reflex" excitement of the tentacles of *Drosera*. It is impossible to foretell to what these discoveries will lead. We cannot but think that this volume will serve, as the previous ones from the same hand have done, to act as finger-posts to direct future observers in those lines of research which are likely to be the most fruitful and profitable. ALFRED W. BENNETT

OUR BOOK SHELF

Progress-Report upon Geographical and Geological Explorations and Surveys west of the 100th Meridian in 1872, under the direction of Brigadier-General A. A. Humphreys, Chief of Engineers, U.S. Army. By First Lieutenant G. M. Wheeler.—Also *Topographical Atlas to illustrate Geographical Explorations west of the 100th Meridian.* (Washington: Government Printing Office, 1874.)

OUR readers are no doubt aware that a large area of the Western States of America is overrun by a number of expeditions intended mainly for the topographical and geological survey of that immense region. Some idea of the number and constitution of these parties will be obtained from two articles in NATURE, vol. viii. pp. 331 and 385. The "Progress-Report" for 1872 of that under charge of Lieut. G. M. Wheeler contains only brief notes of the work done by the various parties; detailed reports will, no doubt, be published eventually, and will occupy several volumes, besides atlases. The present brief report comprises notes of work done, not only in geology and topography, but also in astronomy, meteorology, natural history, ethnology, and photography. Some idea of the amount of work done may be obtained from the fact that the areas covered topographically during the summer months of 1872 exceeded 50,000 square miles lying in Utah, Nevada, and Arizona. The length of lines in the vicinity of which surveys were made is 6,127 miles, in addition to which other 2,067 miles had to be travelled for various purposes. A large portion of the present publication is occupied with reports on the numerous mining-stations which have been established in the district surveyed, as also on irrigation, agriculture, routes of communication, timber lands, and Indians; from the latter the expedition met with no interference, though of course it was accompanied by a military escort. One of the principal features of this report are the lithographic illustrations from camera-negatives of some of the magnificent cañons on the Colorado River; one of these illustrations gives a fine idea of a rain-sculptured rock at Salt-Creek Cañon, Utah.

The atlas which accompanies this Report is a magnificent work and reflects great credit on the U.S. Government and especially on the topographic section of Lieut. Wheeler's Expedition. Besides a general map, it consists of eight sectional maps in photo-lithography on the scale of one inch to eight miles, sufficiently large to give one an excellent idea of the nature of the country which has been surveyed. The maps are the results of the expeditions under Lieut. Wheeler in the years from 1869 to 1873, and embrace parts of California, Nevada, Utah, and Arizona. Every important feature is shown by characteristic and intelligible signs—mountain ranges, plateaux, cañons, bluffs, hills, craters, salt beds, sands, marshes, rivers, creeks, springs, &c., not to mention artificial features, as roads, trails, railroads, towns, &c. We understand that maps of the whole region west of the 100th meridian are to be published on this scale, and in some cases on a more extended one. It will be a magnificent work when complete, a work of which any country might be proud.

Nach den Victoriafällen des Zambesi. Von Edouard Mohr. 2 vols. (Leipzig: Hirt und Sohn, 1875.)

NOTWITHSTANDING that Herr Mohr went over ground that had been traversed previously, a considerable part of it being included in Livingstone's earlier travels, yet his book contains a great deal that is new and well worth publishing. From the time that he left Bremen in November 1868 till his departure from Africa in the beginning of 1871, the interest of his narrative never flags; the book contains frequent passages of genuine eloquence, quite free from bombast or affectation. During part of his journey, Mohr had as his companion the geologist Adolf Hübner, and their starting-point for the Victoria Falls was Durban. From this point they went almost directly to the falls, Hübner, however, leaving his companion before the Zambesi was reached, in order to visit the recently discovered South African diamond fields. Mohr, as we have indicated, tells the story of his journey and its many interesting incidents, particularly well, although, as might be expected, there were none of the dangers to be encountered which face explorers in less frequented parts of Africa. The book is full of valuable information of all kinds concerning the places touched at or visited both on the voyage out and on the journey from Durban to the Zambesi. The book must be considered as a specially valuable contribution to our knowledge of the natural history and geology, as well as to the geography of the district passed through. To the geographer the narrative will be found of very great value, as it contains a record of the carefully ascertained latitude and longitude of the principal points at which halts were made. Appended is a valuable paper by Hübner on the South African Diamond Fields. The work is illustrated by many good woodcuts and a few brilliant chromo-lithographs. There is also a small but clear map of South Africa, showing not only Mohr's route, but the routes of the principal travellers from Livingstone (1841) downwards. Altogether, the work must be considered a really valuable contribution to our knowledge of the region traversed, and seems to us well worth translating into English.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Spectroscopic *prévision* of Rain with a High Barometer

THAT the spectroscope should play a part in the prediction of weather for the common purposes of life was an early thought with many; but I have not heard of its resources being very distinctly appealed to in the late series of most memorable μετέωρα of the atmosphere which have passed over this country, setting nearly at naught most other methods of prediction.

If the instrument has been so used please to correct me. Otherwise permit me to say for myself, that being in Paris on Wednesday July 7, when the great physical and astronomical mathematician of the age, M. Leverrier, stood up in his place in the Academy of Sciences to explain how it had come about that the official predicter of the weather in the *Observatoire* had announced a fine dry period just before the destructive inundations in the South of France with all their train of frightful national calamities began,—I paid attention to the conclusion of his speech, which wound up with announcing "that all the bad symptoms had now (July 7) passed away, that the barometer was high in England, and that all the probabilities united pointed to a fine time coming."

Every day after that for a week the weather only became worse and worse, darker and wetter, in the usually gay city of Paris; and then I transferred myself to London, and was there on the 14th, 15th, and part of the 16th of July, a witness to, if possible, still worse weather, growing darker and wetter all the time. So much, then, for the failure of the ordinary methods of prediction, even in able hands; and let us be lenient to them, for who would or could have expected such deluges of rain with a high barometer, and in the month of July?

Now, however, comes an indication of where the spectroscope seems capable of saying something meteorologically useful: for in all that dark and wet weather in London a pocket spectroscope showed me from every part of the sky a broad dark band on the less refrangible side of D, and partly in the place of it. This band was so intense as to be the chief feature of the whole spectrum; and though no doubt "telluric" in its origin, was very different from the standard telluric effects seen at sunset in ordinary weather.

I feared at the time that this grandly dark spectral band might be of base artificial origin, such as an absorption effect by London smoke; and when journeying northward by rail on July 16, it was certainly charming to find that in proportion as we left London the rain ceased, the dark spectral band decreased, the clouds (amongst which, by the way, there were some remarkable counter-motions chiefly from north to south) diminished, and by the time we reached York fine weather prevailed. The ground there was dry, the rivers low, and the sky spectrum not only presented no dull bands, but the true D line was seen exquisitely fine and neat, as the thinnest imaginable spider-line in a telescope's illuminated field: so thin, fine, and clear indeed, as to offer a delight to the eye, such as none but an earnest spectroscopist can have any idea of.

Thus far, it is true, we have only had dark nebulous bands in place of fine sharp lines as *accompaniments* of rain, London rain too, with a high and steady barometer in the pleasant month of July. But mark, if you please, what follows.

The morning of the 17th of July, in Edinburgh, was glorious with pure blue sky, transparent atmosphere, delicious temperature, and light N.E. Wind. So, too, it continued all the day through, to the delight of thousands upon thousands in the streets. No smoke either was issuing from any of the factory chimneys, for there was a half-holiday or something more, and the usually working population was enjoying itself in the open air. The only clouds were a few brilliant and picturesque currents along the northern horizon, giving something like Alpine mountain snowy tops to the lovely undulations of the Scottish hills.

Simply beautiful were those bright cloud forms as an artistic feature in the general landscape; but in the spectroscope—why, good gracious! I could only say, what is the meaning of this? It was only a little pocket spectroscope, remember, without scale, and with small dispersion; but there was the D line appearing in seven times its usual strength, and with the London smoky band, too, beginning on its less refrangible side. Of the utterly abnormal intensification of D (or rather of some peculiar telluric lines so very near D as not to be separable from it in so small a spectroscope) in the light reflected from those clouds, there could not be the slightest doubt; for whenever the spectroscope was applied to a higher altitude than these clouds, there was little or nothing of the kind; only the usual Fraunhofer lines, fine and clean as generally seen in fine weather. The effect, too, was very different, both in spectrum place and distribution, from what is characteristic of a low sun; while the sun was at the time not low, no sunset colours had visibly begun, the clouds which gave the black intensification of the D line were almost absolutely white, and it was as yet only two o'clock on a fine bright July afternoon.

So I merely made comparative drawings of the spectrum given by these low white clouds, and that afforded by the general sky above them in the Polar neighbourhood, inked them in, and then waited to see what would follow.

And it was this. At 10 P.M. of that very fine day, and without any sensible falling of the high barometer, the sky clouded over completely. At 11 P.M. settled rain began. At 1.30 A.M. it was still raining, and I have reason to believe that it continued all night. It was certainly still raining in the morning of the next day, Sunday, and continued more or less all that day and all that night; while this morning, Monday, July 19, after a heavy thunderstorm, fog and heavier rain began and have proved the order of the day. All this with a barometer still nearly uninfluenced in its serene height and steadiness,* but not so the spectroscope, for, excepting the E line, all the other lines have disappeared in dull bands which occupy their places very nearly, and the London band on the less refrangible side of, and over D, is the main characteristic of all the visible spectral range.

15 Royal Terrace, Edinburgh, July 19 — PIAZZI SMYTH, Astronomer Royal for Scotland

OUR ASTRONOMICAL COLUMN

THE TRIPLE-STAR, SOUTH 503.—In *Astron. Nachr.*, No. 2,045, Baron Dembowski has published measures of this star made in 1873-75, which exhibit large changes in the relative situation of the components, as compared with the measures of Sir James South early in the year 1825. Thus we have for A and B:—

South.....	1825·1	Position	134°·1	Distance	39″·94
Dembowski.	1873·80	,,	120 ·3	,,	8 ·24
,,	1875·21	,,	118 ·8	,,	7 ·07

And for A and C:—

South.....	1825·1	Position	337°·3	Distance	201″·76
Dembowski.	1875·21	,,	335 ·4	,,	232 ·04

Lalande observed A and C on Jan. 23, 1798; Bessel observed all three components on March 6, 1823; and Argelander has an observation of B on Feb. 16, 1856.

On inspecting the above measures there will arise at first sight a suspicion that the change of distance between A and C and in both elements between A and B may be caused by proper motion of A nearly in the line joining A and C. To put this to the test we may take a mean between South's measures of 1825 and the angle and distance of A and C deduced from Bessel's meridian observations in 1823, and compare it with the mean of Dembowski's measures of A and C in 1875. Assuming the differences to be due to proper motion of A, we find for the annual values:—

P.M. in R.A.	+ 0″·389
P.M. in Decl.	− 0 ·461

And, if with this proper motion we reduce Dembowski's mean of measures of A and B in 1875 to the epoch of South's observations there results:—

For 1825·1 ... ... Position 136°·5 Distance 36″·5

Considering that the P.M. adopted is only an approximation, there appears to be little doubt that the changes to which the Baron Dembowski has drawn attention in his

* *Meteorological Journal at Royal Observatory, Edinburgh, for* 1 P.M. *each day.*

1875.	Barometer reduced to sea-level.	Attached Thermometer.	Exterior Thermometer.	Direction of wind.
July 14	29·961	56°·2	58°·4	N.E.
,, 15	30·060	56·3	55·4	E.N.E.
,, 16	30·098	57·1	58·1	N.E.
,, 17	30·043	59·0	59·6	N.E.
,, 18	—	—	—	—
,, 19	29·995	58·3	57·0	N.E.